

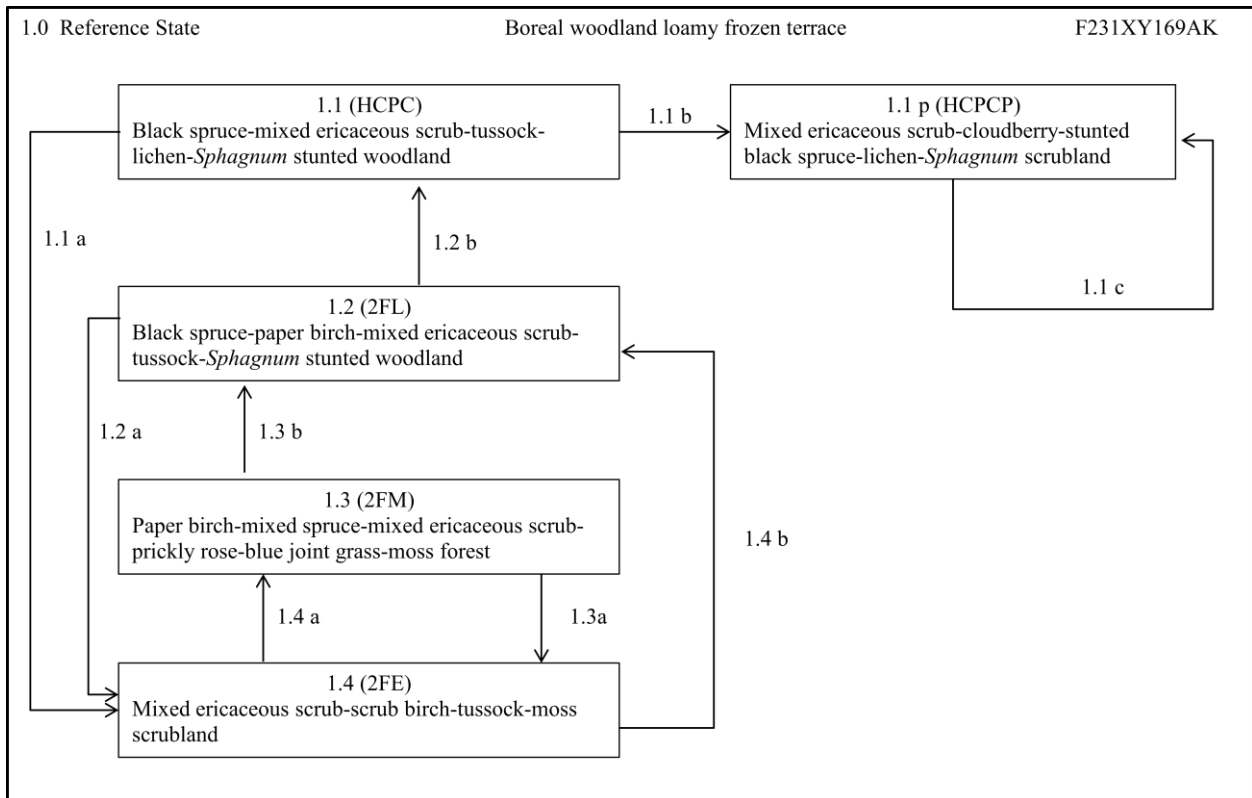
Ecological Dynamics of the Site:

This boreal ecological site occurred on flat areas of floodplain terraces (i.e. slope generally <5%). For community phase 1.1, soils were classified as fibristels with thick organic material over cryoturbated silt or loam (i.e. organic mat often > 50 cm). Soils were typically saturated and ponded water was often observed at sampled plots, which was likely due to thick organic mat and shallow permafrost. The climax phase community was characterized as stunted black spruce woodland with a thick *Sphagnum* mat.

Fire was a disturbance regime that resulted in 5 documented phases. Fire is a natural and typically unmanaged disturbance regime. The typical fire return interval for coniferous forests of interior Alaska is approximately 100 years. For this ecological site, low-severity fire events are more typical than high-severity fire events. Low-severity and high-severity fire events appear to cause differences in the depth of organic material on the soil surface, presence and/or depth of permafrost, present vegetation, and potential vegetation.

It was presumed that sites void of fire for long stretches of time eventually become dominated by *Sphagnum* moss mats. Organic material becomes so thick and has enough moisture so that a fire event would not necessarily reset the community to an early fire sere (i.e. phase 1.4). Sampled communities dominated by *Sphagnum* mats have a less productive black spruce forest and as a result were considered post-climax for this ecological site.

State and Transition Diagram:



State ID Number:	1	State Name:	Reference
State Narrative:	<p>Phases within the reference state were grouped on the structure and dominance of deciduous and coniferous trees which was believed to directly relate to time since last fire event and severity of burn.</p> <p>In a low-severity fire, minimal proportions of the organic mat are consumed and mineral soils will typically not be exposed. Permafrost typically remains in the soil profile, which often perches water. Graminoids and scrubs quickly recolonize and dominate a site using below ground root reserves that were not consumed in the fire event. Due to their semi-serotinous cones, black spruce quickly reestablishes after fire events. With the absence of fire, early fire sere communities associated with this disturbance regime are thought to progress to community phase 1.2.</p> <p>In a high-severity fire, large proportions of the organic mat are consumed and mineral soils will typically be exposed. Permafrost often drops out of the soil profile and the sites become drier. While many pre-fire species likely regenerate as mentioned above, conditions are suitable for the establishment and growth of species with wind-blown seed (e.g. paper birch, fireweed, willow). With the absence of fire, early fire sere communities associated with this disturbance regime are thought to progress to community phase 1.3.</p> <p>The fire return interval plays a large role in the structure of the observed forest. Longer fire return intervals favors development of community phases 1.1 and 1.1P, while shorter fire return intervals favor development of community phases 1.2 and 1.3.</p> <p>Tall trees are defined as trees growing >40' in height, medium trees are defined as growing 15-40' in height, while stunted and regenerative trees are defined as growing less than 15' in height. Tall shrubs are defined to grow greater than 10' in height, medium shrubs are defined to grow 3-10' in height, low shrubs are defined to grow 8" – 3' in height, and dwarf shrubs are defined to grow less than 8" in height.</p>		

Photo 1.1

Community Phase
Number:

1.1

Community
Phase Name:Black Spruce-Mixed Ericaceous
Scrub-Tussock-Lichen-*Sphagnum* Stunted
Woodland

Community Phase Narrative:

Tree cover was evenly split between medium, stunted, and regenerative strata (total mature tree cover ~15%). *Picea mariana* was the dominant tree species observed. The majority of shrub cover occurred in the low and dwarf strata (total shrub cover ~60%). Commonly observed shrub species included *Ledum palustre*, *Rubus chamaemorus*, and *Vaccinium vitis-idaea*. Graminoids were prevalent (~20% cover) the most common observed species being *Eriophorum vaginatum* and *Eriophorum angustifolium*. Forbs were minor vegetative component. Moss (~60% cover) and lichen (~25% cover) combined to form an expansive ground cover. Commonly observed moss and lichen were an assortment of *Sphagnum* sp. and *Cladonia* sp. This phase had 27 observations.

Community Pathways

Pathway Number

Pathway Name & Description

1.1 a

Fire.

1.1 b

Normal time and growth without fire disturbance. Ericaceous scrubs and *Sphagnum* moss dominates understory and surface organic matter increases. Tree and graminoid cover decreases. As a result, sites get wetter and become less productive.

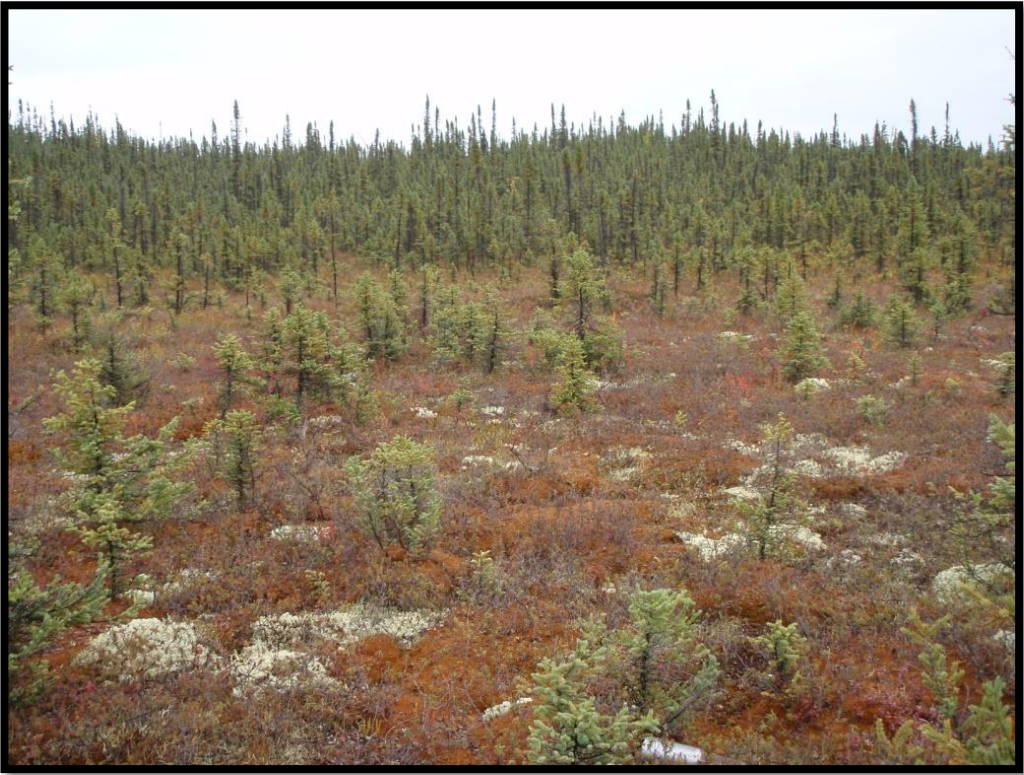
Photo 1.1 p			
Community Phase Number:	1.1p	Community Phase Name:	Mixed Ericaceous Scrub-Cloudberry-Stunted Black Spruce-Lichen- <i>Sphagnum</i> Scrubland
Community Phase Narrative:			
<p>Tree cover was evenly split between stunted and regenerative strata (total mature tree cover was ~5%). <i>Picea mariana</i> was the dominant tree species observed. The majority of shrub cover occurred in the low and dwarf strata (total shrub cover ~85%). Commonly observed shrubs included <i>Ledum palustre</i>, <i>Rubus chamaemorus</i>, <i>Betula nana</i>, <i>Vaccinium vitis-idaea</i>, <i>Vaccinium uliginosum</i>, <i>Empetrum nigrum</i>, and <i>Chamaedaphne calyculata</i>. Graminoids, forbs, and lichen were minor vegetative components. <i>Sphagnum</i> moss formed an expansive ground cover (total moss cover ~85%; <i>Sphagnum</i> moss cover ~65%). This phase had 3 observations.</p>			
Community Pathways			
Pathway Number	Pathway Name & Description		
1.1 c	<p>Fire. While this pathway was not observed in the field, it was believed that fire in this post-climax community would typically not reset succession. Post-climax sites have such thick organic matter that fire does not create conditions for competitive release of graminoids or trees. The transition results in a community that is dominated by scrubs and <i>Sphagnum</i> moss.</p>		

Photo 1.2



Community Phase Number:

1.2

Community Phase Name:

Black Spruce-Paper Birch-Mixed Ericaceous Scrub-Tussock-*Sphagnum* Stunted Woodland


Community Phase Narrative:

In this community phase, remnants of charred trees were often observed. Tree cover was evenly split between medium, stunted, and regenerative stratum (total mature tree cover was 15%). While the dominant tree species was *Picea mariana*, *Betula neoalaskana* and *Picea glauca* were also commonly observed. Shrubs occurred in medium, low, and dwarf stratum (total shrub cover was ~90%). Commonly observed shrubs included *Ledum palustre*, *Betula glandulosa*, *Rubus chamaemorus*, and *Vaccinium vitis-idaea*. Graminoids were abundant (~50% cover) and common species included *Carex bigelowii* and *Eriophorum vaginatum*. Lichen and forbs were minor vegetative components. Moss (~50% cover) formed an expansive ground cover and was split between feathermoss and *Sphagnum* sp. This phase had 26 observations.

Community Pathways

Pathway Number	Pathway Name & Description
1.2 a	Fire.
1.2 b	Normal time and growth without fire. Shrub and graminoid cover decreases, while <i>Sphagnum</i> cover increases. Tree cover remains fairly constant. The fire return interval was presumed to be shorter than phase 1.1 but longer than phase

	1.4.
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Photo 1.3			
Community Phase Number:	1.3	Community Phase Name:	Paper Birch-Mixed Spruce-Mixed Ericaceous Scrub-Prickly Rose-Blue Joint Grass-Moss Forest
Community Phase Narrative:			
<p>This phase was characterized by an expansive paper birch community. Tree cover primarily occurred in the medium and regenerative strata (total mature tree cover was ~40%). While <i>Betula neoalaskana</i> was the dominant species, <i>Picea glauca</i> and <i>Picea mariana</i> were commonly observed. Shrubs occurred in the medium, low, and dwarf strata (total shrub cover ~80%). Commonly observed shrubs included <i>Alnus viridis</i>, <i>Ledum palustre</i>, <i>Rosa acicularis</i>, <i>Rubus chamaemorus</i>, and <i>Vaccinium vitis-idaea</i>. Graminoids (~25% cover) and forbs (~20% cover) were abundant and common species included <i>Calamagrostis canadensis</i> and <i>Equisetum</i> sp. Moss (~40% cover) formed an expansive ground cover that was a mixture of feathermoss and <i>Sphagnum</i> species. This phase had 3 observations.</p>			
Community Pathways			
Pathway Number	Pathway Name & Description		
1.3 a	<p>Fire. When compared to community phase 1.2 or 1.1, community phase 1.3 typically has much less surface organic matter. As a result, a fire in community phase 1.3 may be more likely to expose mineral soils resulting in site conditions</p>		

	that are more suitable to the reestablishment of broadleaf trees.
1.3 b	Normal time and growth without fire event. Permafrost migrates upward into soil profile and eventually paper birch will be replaced by black spruce, ericaceous scrub, and <i>Sphagnum</i> moss community. The fire return interval was presumed to be shorter than phase 1.1 but longer than phase 1.4.



Community Phase Number:	1.4	Community Phase Name:	Mixed Ericaceous Scrub-Scrub Birch-Tussock-Moss Scrubland
Community Phase Narrative:			
<p>Standing charred trees were commonly observed. Tree cover was typically minimal (total mature tree cover was ~2%). Shrub cover primarily occurred in the low and dwarf stratum (total shrub cover ~75%). Commonly observed shrubs included <i>Ledum palustre</i>, <i>Vaccinium vitis-idaea</i>, <i>Betula nana</i>, <i>Rubus chamaemorus</i>, and <i>Vaccinium uliginosum</i>. Graminoids were abundant (~60% cover) and commonly observed species included <i>Carex bigelowii</i> and <i>Eriophorum vaginatum</i>. Forbs and lichens were minor vegetative components. Moss (~40% cover) was abundant and was primarily a mixture of feathermoss and <i>Sphagnum</i> species. This phase had 27 observations.</p>			
Community Pathways			
Pathway Number	Pathway Name & Description		

1.4 a	Normal time and growth without fire. This pathway occurs from a high-intensity fire regime. Shrub, feathermoss, and paper birch cover likely all increase.
1.4 b	Normal time and growth without fire. This pathway occurs from a low-intensity fire regime. Graminoid cover decreases, while black spruce, scrub, and <i>Sphagnum</i> moss cover increases.